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Martha S. Sloan
(signature)

Date of signature and deposit - May 4, 2007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: L. Robert Deardurff	Group Art Unit: 1732
Serial No. 10/689,357	Examiner: Matthew J. Daniels
Filed: October 20, 2003	Attorney Docket: 1-36728
For: PROCESS FOR PREPARING A BLOW MOLDING PREFORM	

May 4, 2007

Mail Stop APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

BRIEF ON APPEAL

Honorable Sir:

This is an appeal under 37 CFR 41.37 from the action of the Examiner dated February 8, 2007, finally rejecting Claims 1 – 10 in the above-identified application. Appellant is herewith filing a timely Notice of Appeal under 37 CFR 41.31.

The Commissioner is hereby authorized to charge $250.00 and any other fees associated with this appeal to Deposit Account No. 50-3156.

A decision on whether to request an oral hearing will be delayed until after the Examiner's Answer has been received.

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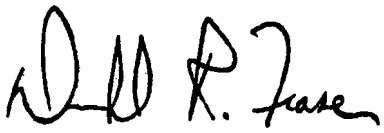
Respectfully submitted,



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REAL PARTY IN INTEREST

The real party in interest is Plastic Technologies, Inc. located in Holland, Ohio, to which the inventor, L. Robert Deardurff, assigned all rights in the invention. The assignment was recorded with the U.S. Patent and Trademark Office on October 20, 2003, at reel 014627, frame 0103.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on, the Board's decision in this pending Appeal.

STATUS OF CLAIMS

Claims 1 - 10 stand rejected, and are being appealed.

STATUS OF AMENDMENTS

There are no amendments pending in the application.

SUMMARY OF THE CLAIMED SUBJECT MATTER

References hereunder are to the Paragraph numbers of the published application No. 2004/0094876 A1.

Appellant's invention as set forth in Claim 1 is directed to a process for preparing a blow molding preform. The process comprises the steps of:

1) melting polymer flakes in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder (Paragraphs 10 and 13);

2) cooling the polymer melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature, by heat exchange with a liquid heat transfer medium (Paragraphs 10, 14, and 15); and

3) forming the cooled polymer melt into a blow molding preform (Paragraphs 10 and 16).

The dependant Claims 2 – 6 contain at least the same limitations as Claim 1. Claim 2 further recites that the polymer comparises polyethylene terephthalate, polyolefin, polyester, polyamide, acrylonitrile acid ester, vinyl chloride, or a derivative, blend, or a copolymer thereof (Paragraph 11). Claim 3 further recites that the polymer is polyethylene terephthalate (Paragraph 11). Claim 4 further recites that the polymer flakes have an average mean particle size from about 1/8 to about 3/4 inch

(Paragraph 12). Claims 5 and 6 further recite that the temperature of the polymer melt at the discharge of the extruder ranges form about 225°C to about 325°C, and about 260°C to about 290°C, respectively (Paragraph 13).

Appellant's invention as set forth in Claim 7 is directed to another embodiment for preparing a blow molding preform. The process comprises the steps of:

1) melting polymer flakes, comprising polyethylene terephthalate, polyolefin, polyester, polyamide, acrylonitrile acid ester, vinyl chloride, or a derivative, blend, or a copolymer thereof, in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder, the temperature of the polymer melt at the discharge of the extruder ranging from about 225 degrees Centigrade to about 325 degrees Centigrade (Paragraphs 10 and 13);

2) cooling the polymer melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature, by heat exchange with a liquid heat transfer medium (Paragraphs 10, 14, and 15); and

3) forming the cooled polymer melt into a blow molding preform (Paragraphs 10 and 16).

Dependant Claims 8 and 9 contain at least the same limitations as Claim 7. Claim 8 further recites that the polymer comprises polyethylene terephthalate (Paragraph 11). Claim 9 further recites that the temperature of the polymer melt at the discharge ranges from about 260°C to about 290°C (Paragraph 13).

Appellant's invention as set forth in Claim 10 is directed to yet another embodiment for preparing a blow molding preform. The process comprises the steps of:

1) melting polymer flakes, comprising polyethylene terephthalate, in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder, the temperature of the polymer melt at the discharge of the extruder ranging from about 260 degrees Centigrade to about 290 degrees Centigrade (Paragraphs 10 and 13);

2) cooling the polymer melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature, by heat exchange with a liquid heat transfer medium (Paragraphs 10, 14, and 15); and

3) forming the cooled polymer melt into a blow molding preform (Paragraphs 10 and 16).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

ISSUE I

Whether Claims 1 – 3 and 5 – 10 are patentable under 35 USC 103(a) as being obvious over U.S. Patent No. 4,622,001to Bright (Bright) in view of U.S. Patent No. 5,411,686 to Hata (Hata)?

ISSUE II

Whether Claim 4 is patentable under 35 USC 103(a) as being obvious over Bright in view of Hata and further in view of U.S. Patent No. 6,320,014 to Takahashi (Takahaski).

ISSUE III

Whether Claims 1 – 3 and 5 – 10 are patentable under 25 USC 103(a) as being obvious over U.S. Patent No. 4,988,279 to Belcher (Belcher) in view of U.S. Patent No. 4,642,043 to Schwarzkopf (Schwarzkopf)?

ISSUE IV

Whether Claim 4 is patentable under 35 USC 103(a) as being obvious over Belcher in view of Schwarzkopf and further in view of U.S. Patent No. 6,320,014 to Takahashi (Takahaski)?

ARGUMENT I

Appellant's invention set forth in independent Claims 1, 7 and 10 is directed to a process including the steps of:

1) melting polymer flakes in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder;
2) cooling the polymer melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature, by heat exchange with a liquid heat transfer medium; and
3) forming the cooled polymer melt into a blow molding preform.

Bright does not teach or suggest the steps of Appellant's claimed process. Bright does not teach or suggest: a) melting polymer flakes; b) cooling the polymer melt stream prior to forming; c) cooling the polymer stream by heat exchange with a liquid heat transfer medium; and d) cooling the polymer melt stream to at least 20° C below an extruder discharge temperature. The Hata reference does not cure the deficiencies of Bright. For at least these reasons, Appellant's claimed process is patentable over Bright in view of Hata.

As the Examiner has previously noted, Bright is silent with respect to melting polymer flakes in a plasticating screw extruder, and cooling the polymer stream to a temperature at least 20°C below the extruder discharge temperature (Final Rejection at page 2). Instead, Bright discloses injection molding machines having a unique mold cavity cooling system that decreases thermal transmission between the heated injection nozzle and the mold cavity (Bright at col. 1, lines 4-8). This is important, according to Bright, in order to increase cycle times (Bright at col. 1, lines 38-43). Without such a system for providing decreased thermal transmission, the heated injection nozzle, which nearly contacts the surface of the mold, would diminish the ability of cooling fluid in the region of the mold nearest the heated injection nozzle to adequately cool the injection molded article (Bright at col. 2, lines 10-15).

Bright also makes it clear that "[u]pon injection of the PET into the mold, it is necessary that the plastic be cooled very quickly to a temperature less than 100° C . . ." (Bright at col. 1, lines 57-59, emphasis added). Thus, Bright describes cooling the plastic only after it is introduced to the mold for forming. Bright does not disclose cooling the plastic prior to forming, as provided in the claims of record.

The Examiner's position is that cooling of the melt traveling through the mold fulfills the claimed cooling because it occurs before solidification of the preform, which the Examiner interprets to be "forming" (Final Rejection at page 12). However, this position is not in accordance with a skilled

artisan's understanding of the term "forming." One of ordinary skill in the art understands that molding is a forming operation, and that a polymer stream will be "formed" upon introduction to a mold. Thus, the Examiner's interpretation of the term "forming" is incorrect. Additionally, to suggest that Bright teaches the cooling of a polymer melt between the injection nozzle and the injection mold is incredulous.

Bright further states that "the mold is typically cooled with the aid of a chilled heat transfer liquid circulated around the mold . . ." (Bright at col. 1, lines 64-66, emphasis added). "The object of the present invention [is] to provide enhanced cooling for the cavity member of a mold while providing enhanced insulation between that cavity element and an adjacent heated nozzle supplying the cavity element . . ." (Bright at col. 2, lines 11-15, emphasis added). Additionally, in Bright's illustrated embodiments of the injection molding machines, "thermal isolation is achieved between the nozzle assembly 12, 112 and the adjacent molded article 48, 148 by providing a space 15, 115 between the outer surface on the heated jacket 16, 116 and surface 57, 157 of cap 56, 156. This space 15, 115 provides a thermal break decreasing the heat transmission between the heated nozzle 12, 112 and the molded article 48, 148" (Bright at col. 4, lines 57-64, emphasis added).

Bright describes cooling the extruded polymer in only one location; namely, in the mold by passing cooling fluid through the mold. Thus, Bright does not describe cooling a polymer melt stream by heat exchange with a liquid heat transfer medium.

Bright further fails to teach or suggest cooling the polymer stream to at least 20° C below an extruder discharge temperature, and forming the cooled polymer melt into a blow molding preform. The Examiner's position is that the claimed temperature drop is an implicit aspect of the method of Bright (Final Rejection at page 6). Bright describes cooling a mold into which a molten plastic is injected. Thus, the molten plastic of Bright is cooled as it is being formed in the mold. The claimed temperature drop of at least 20°C, with respect to the polymer melt stream prior to being formed, is not implicitly found in the disclosure of Bright.

Accordingly, Bright fails to teach or even remotely suggest Appellant's process steps, as recited in Claims 1-10.

Hata does not cure the established deficiencies of Bright. Hata discloses a method and apparatus for controlling injection molding and suppress fluctuations in the temperature of the resin injected into the mold cavity. In Hata's device, "molten resin is adjusted in temperature in a temperature adjusting portion provided in a passage leading from an injection molding machine to the cavity . . ." (Hata at col.

4, lines 33-36). In each disclosed embodiment, "[t]he temperature adjusting portion is provided with a heater for heating the molten resin residing in the temperature adjusting portion . . ." (Hata at col. 4, lines 63-65, emphasis added). A controller calculates "a new target temperature of heating performed by the heater, in order to hold constant the molten resin temperature in the temperature adjusting portion . . ." (Hata at col. 5, lines 10-13). For example, in Fig. 15, "[t]he hot-runner portion 3 is the temperature adjusting portion" (Hata at col. 21, lines 65 and 66), and in Fig. 16, "[t]he barrel portion [of the extruder] 7 corresponds to the temperature adjusting portion, which is provided with heaters 23 and temperature sensors 13" (Hata at col. 22, lines 15 and 16).

Hata teaches that extruded polymer can be heated by a heater in a "temperature adjusting portion," to ensure consistent polymer temperature and properties, before it is injected into a mold cavity where it is subsequently cooled.

The Examiner has cited Hata as a teaching of flakes, a screw extruder, and cooling a melt stream to a temperature of at least 20°C (Final Rejection at page 2). However, Hata is silent as to flakes. Figure 16, item 8, cited as a teaching of flakes, is merely "a hopper 8 for supplying the barrel portion 7 with the resin material" (Hata at col. 22, lines 11-12). Hata also does not suggest that Bright's polymer should be cooled at least 20° C before it is injected into Bright's mold cavity. To the contrary, Hata teaches away from Appellant's second step. Hata teaches that polymer should be heated by a heater in a "temperature adjusting portion" before it is injected into the mold. The Examiner notes that Hata describes a cold runner portion 5 (Final Rejection at page 13). However, the cold runner portion 5 is formed in a split mold, and therefore does not teach cooling the polymer before it is injected into the mold cavity.

Bright in view of Hata does not teach or suggest all the limitations of Appellant's claims. Appellant respectfully requests that the Board reverse the Examiner's rejection of Claims 1 – 3 and 5 – 10.

ARGUMENT II

Takahashi discloses polyester pellets. Takahashi does not disclose a process for preparing a blow molded preform, and so is not properly combinable under 35 USC 103 with Bright or Hata. Takahashi does not disclose the step of cooling a polymer melt stream at the discharge of a screw extruder, as is required in Appellant's process as set forth in Claim 4. Takahashi does not cure the deficiencies of Bright and Hata.

Accordingly, Appellant respectfully requests that the Board reverse the Examiner's rejection of Claim 4.

ARGUMENT III

Appellant's invention set forth in independent Claims 1, 7 and 10 is directed to a process including the steps of:

1) melting polymer flakes in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder;
2) cooling the polymer melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature, by heat exchange with a liquid heat transfer medium; and
3) forming the cooled polymer melt into a blow molding preform.

Belcher does not teach or suggest each of steps of Appellant's claimed process. Belcher does not teach or suggest: a) melting polymer flakes; b) cooling the polymer melt stream prior to forming; c) cooling the polymer stream by heat exchange with a liquid heat transfer medium; and d) cooling the polymer stream to at least 20° C below an extruder discharge temperature. The Schwarzkopf reference does not cure the deficiencies of Belcher. For at least these reasons, Appellant's claimed process is patentable over Belcher in view of Schwarzkopf.

Belcher discloses an apparatus for extrusion blow molding (Belcher at Abstract). PET is conditioned within an extruder, extruded into a set of traveling molds, and blown into plastic articles (Belcher at col. 2, lines 38-43). A molten polymer conditioning process takes place within the screw extruder, where the temperature of the molten polymer is allowed to decrease as the polymer moves toward the exit of the extruder, to attain a temperature between about 490° F and 520° F (Belcher at col. 4, lines 7-10). Thus, cooling, without the use of a liquid heat transfer medium, occurs naturally along the length of the barrel of the extruder.

Belcher is silent as to melting of polymer flakes. Additionally, the Examiner has previously acknowledged that Belcher is silent to cooling after discharging from the extruder, and cooling with a liquid heat transfer medium (Final Rejection at page 8, emphasis added).

The Examiner has asserted that Belcher teaches each of Appellant's claimed steps, but in a rearranged order, *i.e.*, substantially simultaneous, such that the claimed order is *prima facie* obvious (Final Rejection at page 13). Appellant strongly disagrees. Steps of a method claim are construed to require an order if they expressly or implicitly require that they be performed in the order written. See *Interactive Gift Express, Inc. v. CompuServe Inc.*, 256 F.3d 1323, 1342-43 (Fed. Cir. 2000). Appellant's method claims impose a specific order on the performance of the recited steps. The claims expressly recite melting the polymer to prepare a hot polymer melt stream, then cooling the polymer melt stream,

followed by forming the cooled polymer melt into a blow molding preform. These steps could not be performed other than in the order written. The steps of Appellant's method claims expressly recite, or at least implicitly require, that they be performed in the order as written. Accordingly, even if Belcher in view of Schwarzkopf were to teach all claimed limitations, the combined references would not render Appellant's claims *prima facie* obvious.

Belcher also does not teach nor suggest at least the second step of Appellant's claimed process; namely, cooling the polymer stream to a temperature at last 20° C below the extruder discharge temperature, by heat exchange with a liquid heat transfer medium. In Belcher's device, "[t]he temperature of the PET is . . . decreased as it travels along the extruder . . ." (Belcher at col. 3, lines 40-41). There is no cooling by heat exchange with a liquid heat transfer medium along the barrel of the extruder. In fact, there is no cooling at all after the discharge nozzle of the extruder, and certainly no teaching that the polymer discharged from the extruder must be cooled by at least 20° C.

Accordingly, Belcher fails to teach or even remotely suggest Appellant's process steps, as recited in Claims 1-10.

Schwarzkopf fails to cure the deficiencies of Belcher. Schwarzkopf discloses a device for heating and fluid cooling the nozzle of an injection molding machine. The purpose for this device is to be able to operate the injection molding nozzle "within narrow temperature tolerances . . ." (Schwarzkopf at col. 2, lines 21-22). Thus, heating or cooling occurs within the confines of the wall of the extruder nozzle; not between the nozzle and the mold.

Certainly, there is no teaching of at least the second step of Appellant's process; that the polymer is to be cooled by at least 20° C between the discharge of the extruder and the mold. In fact, Schwarzkopf fails to disclose any process temperatures for conditioning then injecting the polymer into a mold cavity.

Neither Belcher not Schwarzkopf, nor their combination, teaches the steps of Appellant's claimed process. Appellant respectfully submits that the Examiner has failed to demonstrate the obviousness of Claims 1-3 and 5-10 under 35 USC 103(a), given Belcher in view of Schwarzkopf.

Accordingly, Appellant respectfully requests that the Board reverse the Examiner's rejection of Claims 1 – 3 and 5 – 10.

ARGUMENT IV

Takahashi discloses polyester pellets. Takahashi does not disclose a process for preparing a blow molded preform, and so is not properly combinable under 35 USC 103 with Belcher or Schwarzkopf. Takahashi does not disclose the step of cooling a polymer melt stream at the discharge of a screw extruder, as is required in Appellant's process as set forth in Claim 4. Takahashi does not cure the deficiencies of Belcher and Schwarzkopf.

Accordingly, Appellant respectfully requests that the Board reverse the Examiner's rejection of Claim 4.

CLAIMS APPENDIX

1. A process for preparing a blow molding preform, comprising:

melting polymer flakes in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder;

cooling the polymer melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature, by heat exchange with a liquid heat transfer medium; and

forming the cooled polymer melt into a blow molding preform.

2. The process for preparing a blow molding perform according to Claim 1, wherein the polymer comprises polyethylene terephthalate, polyolefin, polyester, polyamide, acrylonitrile acid ester, vinyl chloride, or a derivative, blend, or a copolymer thereof.

3. The process for preparing a blow molding preform according to Claim 2, wherein the polymer comprises polyethylene terephthalate.

4. The process for preparing a blow molding perform according to Claim 1, wherein the polymer flakes comprise an average mean particle size from about 1/8 to about 3/4 inch.

5. The process for preparing a blow molding perform according to Claim 1, wherein the temperature of the polymer melt at the discharge of the extruder ranges from about 225 degrees Centigrade to about 325 degrees Centigrade.

6. The process for preparing a blow molding perform according to Claim 5, wherein the temperature of the polymer melt at the discharge of the extruder ranges from about 260 degrees Centigrade to about 290 degrees Centigrade.

7. A process for preparing a blow molding preform, comprising:

melting polymer flakes, comprising polyethylene terephthalate, polyolefin, polyester, polyamide, acrylonitrile acid ester, vinyl chloride, or a derivative, blend, or a copolymer thereof, in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder, the temperature of the polymer melt at the discharge of the extruder ranging from about 225 degrees Centigrade to about 325 degrees Centigrade;

cooling the polymer melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature, by heat exchange with a liquid heat transfer medium; and

forming the cooled polymer melt into a blow molding preform.

8. The process for preparing a blow molding perform according to Claim 7, wherein the polymer comprises polyethylene terephthalate.

9. The process for preparing a blow molding perform according to Claim 7, wherein the temperature of the polymer melt at the discharge of the extruder ranges from about 260 degrees Centigrade to about 290 degrees Centigrade.

10. A process for preparing a blow molding preform, comprising:

melting polymer flakes, comprising polyethylene terephthalate, in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder, the temperature of the polymer melt at the discharge of the extruder ranging from about 260 degrees Centigrade to about 290 degrees Centigrade;

cooling the polymer melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature, by heat exchange with a liquid heat transfer medium; and

forming the cooled polymer melt into a blow molding preform.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.